

CERES LUNAR MEASUREMENTS STATUS

by

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ANALYSES OF 1998 TRMM/CERES LUNAR MEASUREMENTS

PURPOSE

VALIDATE CERES RELATIVE MEASUREMENT PRECISION.

CHARACTERIZE ABSOLUTELY BROADBAND MOON-REFLECTED SOLAR SHORTWAVE AND MOON-EMITTED LONGWAVE RADIANCES IN SI UNITS OF $\text{Wm}^{-2}\text{sr}^{-1}$, ON A RADIOMETRIC SCALE BASED UPON THE INTERNATIONAL TEMPERATURE SCALE OF 1990 (ITS-90).

1998 TRMM/CERES LUNAR MEASUREMENTS

APPROACH

**CORRECT RADIANCES FOR SUN-MOON AND
MOON-SPACECRAFT DISTANCE
VARIATIONS.**

**NORMALIZE RADIANCES TO PHASE ANGLES
OF 7° OR 22°, WHERE LUNAR LIBRATION
EFFECTS ARE CHARACTERIZED.**

TRMM/CERES LUNAR OBSERVATIONS

YEAR	MONT	DAY	HOURS	MINUTES	SECONDS	PHASE	PHASE	INITIAL
UT	H UT	UT	UT	UT	UT	ANGLE DEGS	FUNCTION	AZIMUTH ANGLE DEGS
1998	1	5	15	14	11.189	-88.7	0.329	238.1
1998	1	5	19	8	55.658	-88	0.336	120.5
1998	1	11	8	47	35.867	-16.1	0.963	244.1
1998	1	17	11	21	39.811	54.6	0.663	118.362
1998	1	17	13	44	33.235	53.8	0.671	240.8
1998	1	17	19	51	17.702	56.6	0.643	245.1
1998	2	7	17	26	40.287	-42.4	0.779	261.15
1998	2	13	7	52	59.709	21.8	0.934	230.1
1998	2	13	14	51	52.642	23.5	0.925	128.5
1998	3	9	14	39	12.661	-40.4	0.797	255.4
1998	3	15	8	46	17.893	24.6	0.917	110.8
1998	4	2	1	21	27.291	-111.2	0.159	263.5
1998	4	2	11	21	30.411	-107.6	0.182	98.1
1998	4	5	1	5	32.672	-74.9	0.46	232.25
*1998	4	5	4	8	54.893	-73.4	0.474	232
1998	4	5	11	7	47.782	-71.9	0.49	129.02
1998	4	5	12	39	38.805	-71.1	0.497	135.7
1998*	4	8	14	2	50.649	-36.9	0.827	132.8
1998	4	8	14	2	57.249	-36.9	0.827	126.6
1998	4	14	10	25	52.715	27	0.902	237.59
1998	4	14	18	3	48.599	30.4	0.878	239.2
1998	4	14	22	38	35.453	32.5	0.862	231.28
1998	4	17	15	30	30.231	64.8	0.561	146.7234
1998	4	17	19	28	12.887	64.9	0.56	213.7
1998	4	20	1	37	4.094	93.6	0.288	122.8
*1998	5	2	19	56	12.015	-97.5	0.256	256.1
1998*	5	5	1	23	34.972	-72.3	0.485	241.9
1998	5	5	14	17	12.862	-64.6	0.563	114.1048
1998	6	10	7	1	47.332	5.6	0.995	142.3
1998	6	10	7	56	1.143	5	0.996	213.88
*1998	6	10	14	40	49.233	7.7	0.991	145.8
1998	6	13	19	58	25.831	43.4	0.77	247
1998	7	13	3	7	25.843	44.8	0.757	111.9
1998	7	13	5	30	19.251	44.1	0.763	246.4
1998	7	16	12	58	10.039	87.8	0.338	240.3
1998	8	3	3	8	54.55	-59.8	0.611	147.19
1998	8	3	6	12	23.381	-58.4	0.625	145
1998	8	3	10	10	6.026	-58.3	0.626	214.7
1998	8	3	14	45	39.082	-56.1	0.648	217.1
1998	8	15	18	31	17.169	101.3	0.226	112.7

TERRA/CERES LUNAR OBSERVATIONS

YEAR UT	MON UT	DAY UT	HRS UT	MIN UT	SEC UT	PHASE ANGLE DEGS	MINIMUM FOVangle DEGS	TOTAL COUNTS	SENSORS SHORT COUNTS	WIN COUNTS
								0.143021	0.111099	0.093545
2000	12	12	0	29	42.388	8.8	0.465	219	43	54
2000	12	12	2	8	35.718	9.7	0.496	217	39	54
2000	12	12	8	26	25.937	12.3	0.978	220	39	54
2000	12	20	0	26	40.827	114.8	0.082	16.7	2.5	5
2000	12	20	0	26	47.427	114.8	0.213	17.2	3.7	5.7
2000	12	20	1	29	2.978	115.1	0.449	14.4	2.8	6
2000	12	20	1	29	9.578	115.1	0.166	16.7	2.7	6.7
2000	12	20	1	29	16.178	115.1	0.132	16.5	2.1	6.1
2000	12	20	1	29	22.778	115.1	0.417	16.5	1.7	5.5
2001	1	9	15	44	22.11	3.2	0.487	220.2	48.4	60.5
2001	1	9	16	43	32.868	2.3	0.457		45.6	
2001	1	9	16	43	39.468	2.3	0.118		58	
2001	1	9	16	43	46.068	2.3	0.323		57.2	
2001	1	9	17	23	15.438	2.4	0.307	243.7	56.6	64.8
2001	1	9	17	23	22.038	2.4	0.082	242.1	58.6	63.9
2001	1	9	17	23	28.638	2.4	0.448	199.4	47.3	53.3
2001	1	9	18	22	26.196	1.4	0.457		36.5	
2001	1	9	18	22	32.796	1.4	0.118		52.6	
2001	1	9	18	22	39.396	1.4	0.323		52.7	
2001	1	9	19	2	2.166	1.7	0.492	59.3	11.8	15.5
2001	1	9	19	2	8.766	1.7	0.122	70.8	14.2	16.4
2001	1	9	19	2	15.366	1.7	0.26	68.4	13.5	16.3
2001	1	9	20	1	26.123	0.8	0.188		1.5	
2001	1	9	20	1	32.723	0.8	0.23		1.7	
2001	1	9	20	40	55.493	1.4	0.293	8.4	1.9	3.1
2001	1	9	20	41	8.693	1.4	0.453	6.8	1.5	1.9
2001	1	9	21	40	19.449	1	0.233		15	
2001	1	9	21	40	26.049	1	0.187		13.7	
2001	1	9	22	19	42.22	1.7	0.446	192	46.6	52.7
2001	1	9	22	19	48.819	1.8	0.084	204	50.4	53.7
2001	1	9	22	19	55.419	1.8	0.292	197.3	48.9	51
2001	1	9	23	19	12.776	1.8	0.28	0	59.1	
2001	1	9	23	19	19.376	1.8	0.146		60.3	
2001	1	9	23	19	25.976	1.8	0.484		54.6	
2001	1	9	23	58	35.546	2.4	0.228	243.2	56	65.2
2001	1	9	23	58	42.146	2.4	0.145	238.7	56.7	62.5
2001	1	9	23	58	48.746	2.4	0.506	176.5	39.6	47.3

1998 TRMM/CERES LUNAR MEASUREMENTS

RESULTS

**NEAR 7° PHASE ANGLE, THE CERES TOTAL,
SHORTWAVE, AND WINDOW SENSOR
MEASUREMENTS INDICATE LUNAR FILTERED
RADIANCES OF 26.0, 4.5, AND 4.9 $\text{Wm}^{-2}\text{sr}^{-1}$.**

**NEAR 22° PHASE ANGLE, THE CERES TOTAL,
SHORTWAVE, AND WINDOW SENSOR
MEASUREMENTS INDICATE LUNAR FILTERED
RADIANCES OF 23.0, 3.2, AND 4.5 $\text{Wm}^{-2}\text{sr}^{-1}$.**